

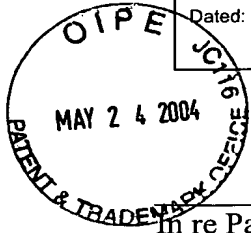
I hereby certify that this correspondence is being deposited with the U.S. Postal Service as Express Mail, Airbill No. ER509328199US, in an envelope addressed to: MS Reply Brief - Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below.

Dated: May 24, 2004

Signature: *Staci Harris*

Staci Harris

Docket No.: HO-P00965US0
(PATENT)



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
James M. Musser, et al.

Application No.: 08/160,965

Filed: December 2, 1993

Art Unit: 1645

For: VACCINES CONTAINING CYSTEINE
PROTEASE AND METHODS TO PROTECT
AGAINST GROUP A STREPTOCOCCI

Examiner: J. Hines

REPLY BRIEF

MS Reply Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This brief is to the Examiner's Answer mailed March 25, 2004. Applicants believe no fees are due with this response. However, if Applicants are in error, the Commissioner is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 06-2375, under Order No. 09507112.

Appellants herewith submit three copies of the Reply Brief.

ISSUE: Are claims 1, 4-35, 46 and 47 described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention?

The issue remains the same, the only new item is the following in which the Appellants direct the Examiner to the attached sequences that were obtained from GenBank, which are associated with accession numbers identified in the inventor's own article "A conserved *Streptococcus pyogenes* extracellular cysteine protease cleaves human fibronectin and degrades vitronectin" by Kapur et al., *Microbial Pathogenesis* **Nov. 1993**; 15: 327-346 ("Kapur reference").

In the Examiner's Answer, the Examiner states that the Appellants failed to point to one piece of art that contained a sequence that is allegedly "known and old" in the art. Appellants have maintained that the instant specification in addition to the Kapur reference provided evidence that the inventors had possession of the invention at the time of filing. The Kapur reference (which was published prior to the filing date of the instant application) reported the methodical and prolific sequencing of 39 SPEB alleles in 67 *S. pyogenes* strains. The Examiner appears to have misunderstood the significance of the Kapur reference since the Examiner believes that the Appellants are arguing that in every ten amino acids one or two amino acids vary. This is not correct. The significance of the Kapur reference is to provide evidence that the *speB* gene is well conserved (See Abstract), as well as, to provide evidence of the GenBank accession numbers (listed in the **figure legend** of Figure 3) assigned to the polynucleotide sequences coding for the complete amino acid sequences of the allelic variants of *speB* (EMBL/GenBank/DDBL accession numbers L26125-L26162).

As the Appellants have stressed, the claims are directed to a SPEB protein having at least one substitution at amino acid residue positions Lys145, Cys192, His340, Asn356 and/or Trp357 (Appellants refer the Examiner to the accompanying amendment filed concurrently with this Reply Brief). All of the claimed amino acid residue positions are highly conserved among the *speB* alleles, as evident from the Kapur reference. To further illustrate this point, Appellants have provided copies of the amino acid sequences available from GenBank. These sequences were available as of the filing date of the application,

December 2, 1993 (date is highlighted on all attached sequences). Appellants assert that the attached amino acid sequences correspond to the alleles identified as GenBank accession numbers L26125-L26162, which is indicated in the **figure legend** of Figure 3. One of skill in the art is aware that the GenBank database provides a link between the polynucleotide sequences and the amino acid sequences, thus, one of skill in the art would be able to obtain the amino acid sequence by entering the accession numbers for the polynucleotide acid sequences.

To further aide the Examiner, Appellants have highlighted in pink the specific amino acid positions that are claimed in the present invention, i.e., Lys145, Cys192, His340, Asn356 and/or Trp357 (One letter codes for the amino acids which are well known are as follows: lysine is L, cysteine is C, histamine is H, asparagine is N and tryptophan is W). From this evidence, the Examiner will notice that all sequences associated with accession numbers L26125-L26162 contain the same amino acids at the claimed amino acid positions. Since these amino acids are conserved in all alleles, it is not relevant to have a “wild-type” sequence as requested by the Examiner because all the sequences could be the initial starting sequence in which Lys145, Cys192, His340, Asn356 and/or Trp357 are substituted. Thus, one of skill in the art could utilize the GenBank database to obtain an SPEB sequence to produce the claimed invention.

Even if a person of skill in the art was not aware of the Kapur reference to obtain the GenBank accession numbers, one of skill in the art could search the GenBank database using the identified MGAS (Musser Group A Streptococcus) numbers in Table 1, pages 9-18, of the specification. These numbers are also highlighted in the attached copies obtained from the GenBank database. The attached sequence copies provide evidence that the MGAS numbers are linked to the GenBank accession numbers L26125-L26162, which are linked to the SPEB amino acid sequences. Thus, one of skill in the art would be able to locate the SPEB sequences to produce the claimed invention.

Appellants remind the Examiner that the GenBank database is utilized consistently by those of skill in this art, and it is well-settled case law that what is conventional or well known to a skilled artisan need not be disclosed in detail. See *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d at 1384, 231 USPQ at 94. Therefore, the complete polynucleotide and amino acids structure of the SPEB protein used as a reference sequence to generate the

invention of the instant claims was available to skilled artisans at the time of the instant application and *is not required, given that the sequence was in the public domain prior to the time of filing.*

Thus, in summary, Appellant asserts that the specification did provide clear possession of the invention. Appellant reminds the Board that the written description requirement is a question of fact which must be resolved on a case-by-case basis (see, *e.g. Vas-Cath, Inc. v. Mahurkar*, 935 F.2d at 1563, 19 USPQ 2d at 1116 (Fed. Cir. 1991)), and Appellant asserts that the instant specification certainly met the standards for written description under 35 U.S.C. §112, paragraph 1.

Appellant respectfully requests reversal of the Examiner's rejection and subsequent allowance of all pending claims.

Dated: May 24, 2004

Respectfully submitted,

By 

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Attorneys for Applicant



Search for

☐ 1: AAA26979. pyrogenic exotoxi...[gi:431614] BLink, Domains, Links

LOCUS AAA26979 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA26979

VERSION AAA26979.1 GI:431614

DBSOURCE locus STRSPEBA accession [L26125.1](#)

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes
Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

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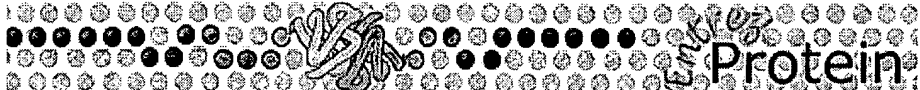
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[Entrez](#) [PubMed](#) [Nucleotide](#) [Protein](#) [Genome](#) [Structure](#) [PMC](#) [Taxonomy](#) [Boo](#)

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LOCUS AAA26992 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA26992

VERSION AAA26992.1 GI:431640

DBSOURCE locus STRSPEBB accession [L26126.1](#)

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM [Streptococcus pyogenes](#)

Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

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LOCUS AAA26993 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA26993

VERSION AAA26993.1 GI:431642

DBSOURCE locus STRSPEBC accession [L26127.1](#)

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes
Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

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DEFINITION pyrogenic exotoxin B.

ACCESSION AAA26994

VERSION AAA26994.1 GI:431644

DBSOURCE locus STRSPEBD accession [L26128.1](#)

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes

Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES Location/Qualifiers

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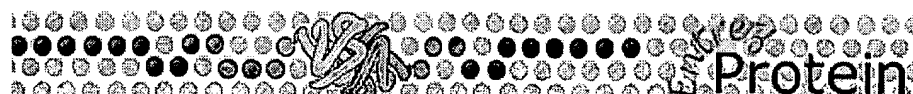
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Nucleotide

Protein

Genome

Structure

PMC

Taxonomy

Boo

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BLink, Domains, Links

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DEFINITION pyrogenic exotoxin B.

ACCESSION AAA26995

VERSION AAA26995.1 GI:431646

DBSOURCE locus STRSPEBE accession [L26129.1](#)

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM [Streptococcus pyogenes](#)

Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES

Location/Qualifiers

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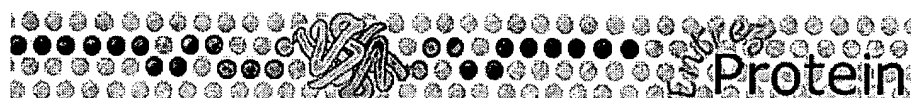
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LOCUS AAA26996 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA26996

VERSION AAA26996.1 GI:431648

DBSOURCE locus STRSPEBF accession [L26130.1](#)

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM [Streptococcus pyogenes](#)

Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

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LOCUS AAA26997 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA26997

VERSION AAA26997.1 GI:431650

DBSOURCE locus STRSPEBG accession [L26131.1](#)

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes
Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

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LOCUS AAA26998 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA26998

VERSION AAA26998.1 GI:431652

DBSOURCE locus STRSPEBH accession [L26132.1](#)

KEYWORDS

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes

Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES Location/Qualifiers

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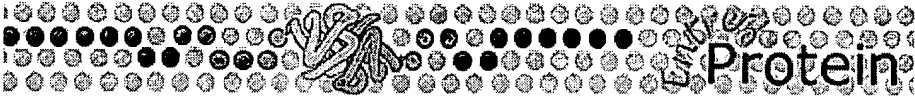
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[BLink](#), [Domains](#), [Links](#)

LOCUS AAA26999 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA26999

VERSION AAA26999.1 GI:431654

DBSOURCE locus STRSPEBI accession [L26133.1](#)

KEYWORDS

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes

Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES

Location/Qualifiers

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Protein

1..398

/product="pyrogenic exotoxin B"

/function="cysteine protease precursor"

CDS

1..398

/gene="speB gene"

/coded_by="L26133.1:161..1357"

/note="allele 17"

/transl_table=11



ORIGIN

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241 nwnnilptys gresnvqkma iselmadvgi svdmgygpss gsagssrvqr alkenfgynq
301 svhqinrsdf skqdwesqid kelsqnqpyv yqgvqkvgg@ afvidgadgr nfyhvn@wgw
361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp
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Show:

☐ 1: [AAA27000](#). pyrogenic exotoxi...[gi:431656] BLink, Domains, Links

LOCUS AAA27000 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA27000

VERSION AAA27000.1 GI:431656

DBSOURCE locus STRSPEBJ accession [L26134.1](#)

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes

Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES

Location/Qualifiers

source

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/organism="Streptococcus pyogenes"

/isolate="MGAS 587"

/db_xref="taxon:1314"

Protein

1..398

/product="pyrogenic exotoxin B"

/function="cysteine protease precursor"

CDS

1..398

/gene="speB gene"

/coded_by="L26134.1:161..1357"

/note="allele 18"

/transl_table=11


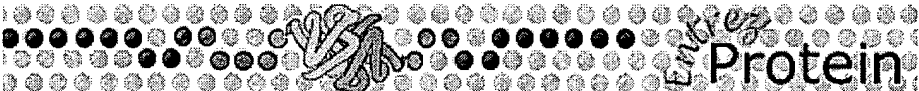
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181 qsfvgghaat ggvatataqi mkyhnypnkg lkdytytlss nnpynfhpkn lfaaistrqy
241 nwnnilptys gresnvqkma iselmadvgi svdm dygpss gsagssrvqr alrenfgynq
301 svhqinrsdf skqdwesqid kelsqnqpy yqgvgkvggg afvidgadgr nfyhvnggwg
361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp
```

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Show:

☐ 1: [AAA27001](#). pyrogenic exotoxi...[gi:431658] [BLink, Domains, Links](#)

LOCUS AAA27001 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA27001

VERSION AAA27001.1 GI:431658

DBSOURCE locus STRSPEBK accession [L26135.1](#)

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes

Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES Location/Qualifiers

source 1..398
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 /isolate="MGAS 796"
 /db_xref="taxon:1314"
Protein 1..398
 /product="pyrogenic exotoxin B"
 /function="cysteine protease precursor"
CDS 1..398
 /gene="speB gene"
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 /note="allele 19"
 /transl_table=11

ORIGIN

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181 qsfvgqhaat g1vatataqi mkyhnpnkg lkdytytlss nnp1fnhpkn lfaaistrqy
241 nwnnilptys gresnvqkma iselmadvgi svdm1dygpss gsagssrvqr alkenfgynq
301 svhqinrsdf skqdweaqid kelsqnqpv1y yqgv1gkv1gg1h afvidgadgr nfyh1v1g1wg1
361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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Search for

☐ 1: AAA27002. pyrogenic exotoxi...[gi:431660] BLink, Domains, Links

LOCUS AAA27002 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA27002

VERSION AAA27002.1 GI:431660

DBSOURCE locus STRSPEBL accession L26136.1

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes
Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES Location/Qualifiers

source 1..398
/organism="Streptococcus pyogenes"
/isolate="MGAS 800"
/db_xref="taxon:1314"

Protein 1..398
/product="pyrogenic exotoxin B"

CDS 1..398
/gene="speB gene"
/coded_by="L26136.1:161..1357"
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ORIGIN

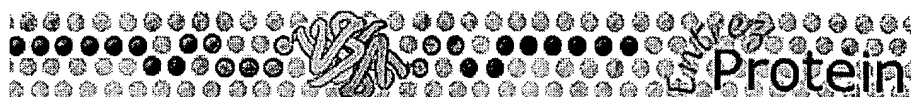
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241 nwnnilptys gresnvqkma iselmadvgi svdmgypss gsagssrvqr alkenfgynq
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361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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Show:

☐ 1: AAA27003. pyrogenic exotoxi...[gi:431662]

[BLink](#), [Domains](#), [Links](#)

LOCUS AAA27003 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA27003

VERSION AAA27003.1 GI:431662

DBSOURCE locus STRSPEBM accession [L26137.1](#)

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes

Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES Location/Qualifiers

source 1..398
 /organism="Streptococcus pyogenes"
 /isolate="MGAS 1233"
 /db_xref="taxon:1314"
 Protein 1..398
 /product="pyrogenic exotoxin B"
 /function="cysteine protease precursor"
 CDS 1..398
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ORIGIN

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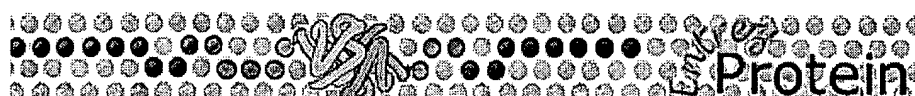
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361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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☐ 1: AAA27004. pyrogenic exotoxi...[gi:431664] BLink, Domains, Links

LOCUS AAA27004 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA27004

VERSION AAA27004.1 GI:431664

DBSOURCE locus STRSPEBN accession [L26138.1](#)

KEYWORDS

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes

Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES

Location/Qualifiers
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 /isolate="MGAS 1226"
 /db_xref="taxon:1314"
 Protein 1..398
 /product="pyrogenic exotoxin B"
 /function="cysteine protease precursor"
 CDS 1..398
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 /note="allele 22"
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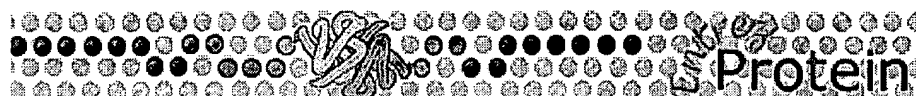
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241 nwnnilptys gresnvqkma iselmadvgi svdm dygpss gsagssrvqr alkenfgynq
301 svhqinrgdf skqdweaqid kelsqnqpv yqgvgkvggg afvidgadgr nfyhvgg
361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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☐ 1: AAA27005. pyrogenic exotoxi...[gi:431666]

BLink, Domains, Links

LOCUS AAA27005 398 aa linear BCT 02-DEC-1993
 DEFINITION pyrogenic exotoxin B.
 ACCESSION AAA27005
 VERSION AAA27005.1 GI:431666
 DBSOURCE locus STRSPEBO accession L26139.1
 KEYWORDS .
 SOURCE Streptococcus pyogenes
 ORGANISM Streptococcus pyogenes
 Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae;
 Streptococcus.
 REFERENCE 1 (residues 1 to 398)
 AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R.,
 Hamill,R.J., Patti,J.M. and Musser,J.M.
 TITLE A conserved Streptococcus pyogenes extracellular cysteine protease
 cleaves human fibronectin and degrades vitronectin
 JOURNAL Microb. Pathog. (1993) In press
 COMMENT Method: conceptual translation.
 FEATURES Location/Qualifiers
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 Protein 1..398
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 /function="cysteine protease precursor"
 CDS 1..398
 /gene="speB gene"
 /coded_by="L26139.1:161..1357"
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ORIGIN

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241 nwnnilptys gresnvqkma iselmadvgi svdm dygpss gsagssrvqr alkenfgynq
301 svhqinrsdf skqdweaqid kelsnqpvy yqgvgkvvgg afvidgadgr nfyhvggwg
361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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☐ 1: AAA27006. pyrogenic exotoxi...[gi:431668] BLink, Domains, Links

LOCUS AAA27006 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA27006

VERSION AAA27006.1 GI:431668

DBSOURCE locus STRSPEBP accession [L26140.1](#)

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes
Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES Location/Qualifiers

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Protein 1..398
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CDS 1..398
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ORIGIN

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 Show:
☐ 1: [AAA27007](#). pyrogenic exotoxi...[gi:431670]

BLink, Domains, Links

LOCUS AAA27007 398 aa linear BCT 02-DEC-1993
 DEFINITION pyrogenic exotoxin B.
 ACCESSION AAA27007
 VERSION AAA27007.1 GI:431670
 DBSOURCE locus STRSPEBQ accession [L26141.1](#)
 KEYWORDS .
 SOURCE Streptococcus pyogenes
 ORGANISM Streptococcus pyogenes
 Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae;
 Streptococcus.
 REFERENCE 1 (residues 1 to 398)
 AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R.,
 Hamill,R.J., Patti,J.M. and Musser,J.M.
 TITLE A conserved Streptococcus pyogenes extracellular cysteine protease
 cleaves human fibronectin and degrades vitronectin
 JOURNAL Microb. Pathog. (1993) In press
 COMMENT Method: conceptual translation.
 FEATURES Location/Qualifiers
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Protein 1..398
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 /note="allele 25"
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ORIGIN

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☐ 1: AAA27008. pyrogenic exotoxi...[gi:431672] BLink, Domains, Links

LOCUS AAA27008 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA27008

VERSION AAA27008.1 GI:431672

DBSOURCE locus STRSPEBR accession L26142.1

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes
Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES

source 1..398
/organism="Streptococcus pyogenes"
/isolate="MGAS 1991"
/isolate="MGAS 1914A"
/isolate="MGAS 1911"
/isolate="MGAS 758"
/db_xref="taxon:1314"

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/function="cysteine protease precursor"

CDS 1..398
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/coded_by="L26142.1:161..1357"
/note="allele 26"
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ORIGIN

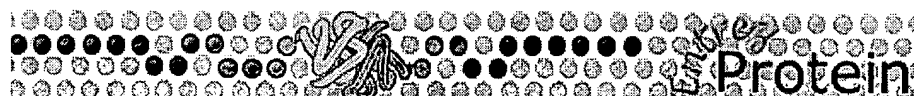
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361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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☐ 1: AAA27009. pyrogenic exotoxi...[gi:431674]

BLink, Domains, Links

LOCUS AAA27009 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA27009

VERSION AAA27009.1 GI:431674

DBSOURCE locus STRSPEBS accession [L26143.1](#)

KEYWORDS

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes

Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES

Location/Qualifiers

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Protein

1..398

/product="pyrogenic exotoxin B"

/function="cysteine protease precursor"

CDS

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/note="allele 27"

/transl_table=11

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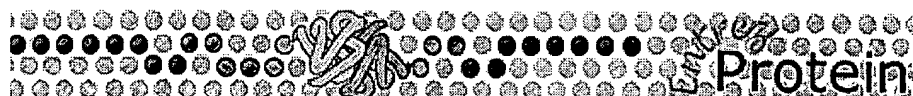
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241 nwnnilptys gresnvqkma iselmadvgi svdmdygpss gsagssrvqr alkenfgynq
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361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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 Show:
☐ 1: AAA27010. pyrogenic exotoxi...[gi:431676]

BLink, Domains, Links

LOCUS AAA27010 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA27010

VERSION AAA27010.1 GI:431676

DBSOURCE locus STRSPEBT accession L26144.1

KEYWORDS

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes

Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES

Location/Qualifiers

source

1..398

/organism="Streptococcus pyogenes"

/isolate="MGAS 162"

/db_xref="taxon:1314"

Protein

1..398

/product="pyrogenic exotoxin B"

/function="cysteine protease precursor"

CDS

1..398

/gene="speB gene"

/coded_by="L26144.1:161..1357"

/transl_table=11

ORIGIN

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121 mesyveqike nkkldttyag taei qpvvk slldskgiy nqgnpynllt pviekvvpge
181 qsfvgghaat gvatataqi mkyhnpnkg lkdytytlss nnpynhpkpkn lfaaistrqy
241 nwnnilptys gresnvqkma iselmadvgi svdm dygpss gsagssrvqr alkenfgynq
301 svhqinrsdf skqdweaqid kelsqnqpv yqgvkvvgg afvidgadgr nfyhvwgw
361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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Search for

☐ 1: AAA27011. pyrogenic exotoxi...[gi:431678] BLink, Domains, Links

LOCUS AAA27011 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA27011

VERSION AAA27011.1 GI:431678

DBSOURCE locus STRSPEBU accession [L26145.1](#)

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes
Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES

source 1..398
/organism="Streptococcus pyogenes"
/isolate="MGAS 1841"
/db_xref="taxon:1314"

Protein 1..398
/product="pyrogenic exotoxin B"
/function="cysteine protease precursor"

CDS 1..398
/gene="speB gene"
/coded_by="L26145.1:161..1357"
/note="allele 28"
/transl_table=11

ORIGIN

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1 mnkkklgirl lsllalggfv lanpvfadqn farnekeakd saitfiqksa aikagarsae
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121 mesyveqike nkkldttyag taeikqpvvk slldskgiy nqgnpynllt pvielvkpge
181 qsfvgqhaat ggvatataqi mkyhnpnkg lkdytytlss nnpyfhnphkn lfaaistrqy
241 nwnnilptys gresnvqkma iselmadvgi svdmdygpss gsagssrvqr alkenfgynq
301 svhqinrsdf skqdweaqid kelsqnqpv yqgvkvvgg afvidgadgr nfyhvwgwg
361 gvdsdgffrld alnpsalgtg ggaggfngyq savvgikp

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Search for

☐ 1: AAA27012. pyrogenic exotoxi...[gi:431680] BLink, Domains, Links

LOCUS AAA27012 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA27012

VERSION AAA27012.1 GI:431680

DBSOURCE locus STRSPEBV accession [L26146.1](#)

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes

Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES Location/Qualifiers

source 1..398
 /organism="Streptococcus pyogenes"
 /isolate="MGAS 75"
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 /isolate="MGAS 1590"
 /isolate="MGAS 1864"
 /isolate="MGAS 327"
 /isolate="MGAS 317"
 /db_xref="taxon:1314"
Protein 1..398
 /product="pyrogenic exotoxin B"
 /function="cysteine protease precursor"
CDS 1..398
 /gene="speB gene"
 /coded_by="L26146.1:161..1357"
 /note="allele 3"
 /transl_table=11

ORIGIN

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121 mesyveqike nkkldttyag taetiagpvvk slldskgiyh nqgnpynllt pviekvkgpe
181 qsfvgqhaat g@vatataqi mkyhnypnkg lkdytytlss nnpynfnhpkn lfaaistrqy
241 nwnnilptys gresnvqkma iselmadvgi svdm dygpss gsagssrvqr alkenfgynq
301 svhqinrsdf skqdweaqid kelsqnqpvpy yqgvkvvgg afvidgadgr nfyhvwgwg
361 gvsgdggfrld alnpsalgtg ggaggfngyq savvgikp

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Search for

☐ 1: AAA27013. pyrogenic exotoxi...[gi:431682] BLink, Domains, Links

LOCUS AAA27013 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA27013

VERSION AAA27013.1 GI:431682

DBSOURCE locus STRSPEBW accession [L26147.1](#)

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes
Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES Location/Qualifiers

source 1..398
/organism="Streptococcus pyogenes"
/isolate="MGAS 1838"
/db_xref="taxon:1314"

Protein 1..398
/product="pyrogenic exotoxin B"
/function="cysteine protease precursor"

CDS 1..398
/gene="speB gene"
/coded_by="L26147.1:161..1357"
/note="allele 30"
/transl_table=11

ORIGIN

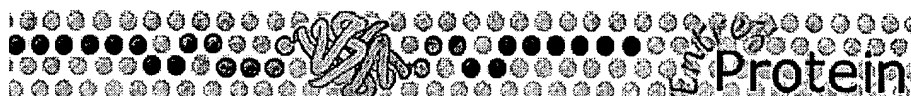
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181 qsfvgqhaat g2vatataqi mkyhnypnkg lkdytytlss nnpynfhpkn lfaaistrqy
241 nwnnilptys gresnvqkma iselmadvgi svdmgygpss gsagssrvqr alkenfgynq
301 svhqinrsdf skqdweaqid kelsqnqpv yqgvkvvgg3 afvidgadgr nfyh4vwgwg
361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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☐ 1: AAA27014. pyrogenic exotoxi...[gi:431684]

BLink, Domains, Links

LOCUS AAA27014 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA27014

VERSION AAA27014.1 GI:431684

 DBSOURCE locus STRSPEBX accession [L26148.1](#)

KEYWORDS .

SOURCE Streptococcus pyogenes

 ORGANISM Streptococcus pyogenes

Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES

Location/Qualifiers

source

1..398

/organism="Streptococcus pyogenes"

/isolate="MGAS 1870"

/db_xref="taxon:1314"

Protein

1..398

/product="pyrogenic exotoxin B"

/function="cysteine protease precursor"

CDS

1..398

/gene="speB gene"

/coded_by="L26148.1:161..1357"

/note="allele 31"

/transl_table=11

ORIGIN

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121 mesyveqike nkkldttyag taeiaqpvvk slldskgi hy nqgnpynllt pvielvkpge
181 qsfvgqhaat ggvatataqi mkyhnypnkg lkdytytlss nnpynhpkn lfaaistrqy
241 nwnnilptys gresnvqkma iselmadvgi svdm dygpss gsagssrvqr alkenfgynq
301 svhqinrsdf skqdweaqid kelsqnqpvy yqgv gkvgg afvidgadgr nfyhvnwggw
361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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☐ 1: AAA27015. pyrogenic exotoxi...[gi:431686]

BLink, Domains, Links

LOCUS AAA27015 398 aa linear BCT 02-DEC-1993
 DEFINITION pyrogenic exotoxin B.
 ACCESSION AAA27015
 VERSION AAA27015.1 GI:431686
 DBSOURCE locus STRSPEBY accession [L26149.1](#)
 KEYWORDS .
 SOURCE Streptococcus pyogenes
 ORGANISM Streptococcus pyogenes
 Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae;
 Streptococcus.
 REFERENCE 1 (residues 1 to 398)
 AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R.,
 Hamill,R.J., Patti,J.M. and Musser,J.M.
 TITLE A conserved Streptococcus pyogenes extracellular cysteine protease
 cleaves human fibronectin and degrades vitronectin
 JOURNAL Microb. Pathog. (1993) In press
 COMMENT Method: conceptual translation.
 FEATURES Location/Qualifiers
 source 1..398
 /organism="Streptococcus pyogenes"
 /isolate="MGAS 1898"
 /db_xref="taxon:1314"
Protein 1..398
 /product="pyrogenic exotoxin B"
 /function="cysteine protease precursor"
CDS 1..398
 /gene="speB gene"
 /coded_by="L26149.1:161..1357"
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ORIGIN

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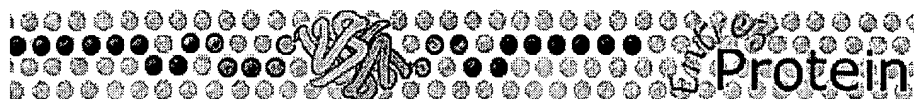
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121 mesyveqike nkkldttyag taeiagpvrk slldskgihy nqgnpynllt pviekvkpge
181 qsfvgqhaat g@vatataqi mkyhnyppnkg lkdytytlss nnpynfhpkn lfaaistrqy
241 nwnnilptys gresnvqkma iselmadvgi svdmgygpss gsagssrvqr alkenfgynq
301 svhqinrsdf skqdwesqid kelsqnqpyv yqgvkvvgga afvidgadgr nfyhvwgwg
361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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☐ 1: AAA27016. pyrogenic exotoxi...[gi:431688]

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LOCUS AAA27016 398 aa linear BCT 02-DEC-1993
 DEFINITION pyrogenic exotoxin B.
 ACCESSION AAA27016
 VERSION AAA27016.1 GI:431688
 DBSOURCE locus STRSPEBZ accession [L26150.1](#)
 KEYWORDS .
 SOURCE Streptococcus pyogenes
 ORGANISM Streptococcus pyogenes
 Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae;
 Streptococcus.
 REFERENCE 1 (residues 1 to 398)
 AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R.,
 Hamill,R.J., Patti,J.M. and Musser,J.M.
 TITLE A conserved Streptococcus pyogenes extracellular cysteine protease
 cleaves human fibronectin and degrades vitronectin
 JOURNAL Microb. Pathog. (1993) In press
 COMMENT Method: conceptual translation.
 FEATURES Location/Qualifiers
 source 1..398
 /organism="Streptococcus pyogenes"
 /isolate="MGAS 1832"
 /db_xref="taxon:1314"
Protein 1..398
 /product="pyrogenic exotoxin B"
 /function="cysteine protease precursor"
CDS 1..398
 /gene="speB gene"
 /coded_by="L26150.1:161..1357"
 /note="allele 33"
 /transl_table=11

ORIGIN

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1 mnkkklgirl lsllalggfv lanpvfadqn farnekeakd saitfiqksa aikagarsae
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361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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☐ 1: AAA26980. pyrogenic exotoxi...[gi:431616] BLink, Domains, Links

LOCUS AAA26980 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA26980

VERSION AAA26980.1 GI:431616

DBSOURCE locus STRSPEBAA accession [L26151.1](#)

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes

Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES Location/Qualifiers

source 1..398
 /organism="Streptococcus pyogenes"
 /isolate="MGAS 1871"
 /db_xref="taxon:1314"
Protein 1..398
 /product="pyrogenic exotoxin B"
 /function="cysteine protease precursor"
CDS 1..398
 /gene="speB gene"
 /coded_by="L26151.1:161..1357"
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 /transl_table=11

ORIGIN

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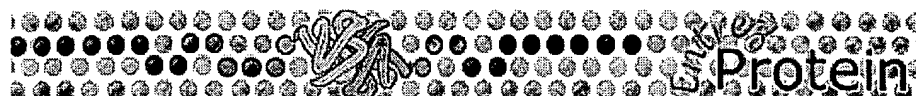
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241 nwnnilptys gresnvqkma iselmadvgi svdm3dygpss gsagssrvqr alkenfgynq
301 svhqinrgdf skqdweaqid kelsqnqpvy yqgv4gkv5gga afvidgadgr nfyhv6gwg
361 gvsdgffrld alnpsalgtg ggadgfngyq savvgikp

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☐ 1: AAA26981. pyrogenic exotoxi...[gi:431618]

BLink, Domains, Links

LOCUS AAA26981 398 aa linear BCT 02-DEC-1993
 DEFINITION pyrogenic exotoxin B.
 ACCESSION AAA26981
 VERSION AAA26981.1 GI:431618
 DBSOURCE locus STRSPEBAB accession L26152.1
 KEYWORDS .
 SOURCE Streptococcus pyogenes
 ORGANISM Streptococcus pyogenes
 Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae;
 Streptococcus.
 REFERENCE 1 (residues 1 to 398)
 AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R.,
 Hamill,R.J., Patti,J.M. and Musser,J.M.
 TITLE A conserved Streptococcus pyogenes extracellular cysteine protease
 cleaves human fibronectin and degrades vitronectin
 JOURNAL Microb. Pathog. (1993) In press
 COMMENT Method: conceptual translation.
 FEATURES Location/Qualifiers
 source 1..398
 /organism="Streptococcus pyogenes"
 /isolate="MGAS 1901"
 /db_xref="taxon:1314"
 Protein 1..398
 /product="pyrogenic exotoxin B"
 /function="cysteine protease precursor"
 CDS 1..398
 /gene="speB gene"
 /coded_by="L26152.1:161..1357"
 /note="allele 35"
 /transl_table=11

ORIGIN

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121 mesyveqike nkkldttyag taeiagpvvk slldskgi hy nqgnpynllt pviekvkpg
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241 nwnnilptys gresnvqkma iselmadvgi svdmdygpss gsagssrvqr alkenfgynq
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361 gvsgdggfrld alnpsalgtg ggaggfngyq savvgikp

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LOCUS AAA26982 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA26982

VERSION AAA26982.1 GI:431620

DBSOURCE locus STRSPEBAC accession [L26153.1](#)

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes
Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES

source 1..398
/organism="Streptococcus pyogenes"
/isolate="MGAS 1842"
/db_xref="taxon:1314"

Protein 1..398
/product="pyrogenic exotoxin B"
/function="cysteine protease precursor"

CDS 1..398
/gene="speB gene"
/coded_by="L26153.1:161..1357"
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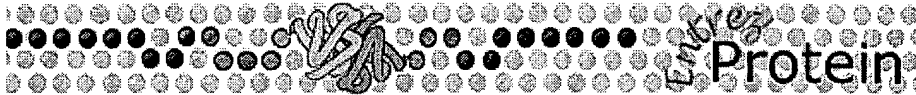
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241 nwnnilptys gresnvqkma iselmadvgi svdm dygpss gsagssrvqr alkenfgynq
301 svhqinrgdf skqdweaqid kelsqnqpv yqgvqkvgg h afvidgadgr nfyhvwgw
361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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LOCUS AAA26983 398 aa linear BCT 02-DEC-1993
 DEFINITION pyrogenic exotoxin B.
 ACCESSION AAA26983
 VERSION AAA26983.1 GI:431622
 DBSOURCE locus STRSPEBAD accession [L26154.1](#)
 KEYWORDS
 SOURCE Streptococcus pyogenes
 ORGANISM Streptococcus pyogenes
 Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae;
 Streptococcus.
 REFERENCE 1 (residues 1 to 398)
 AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R.,
 Hamill,R.J., Patti,J.M. and Musser,J.M.
 TITLE A conserved Streptococcus pyogenes extracellular cysteine protease
 cleaves human fibronectin and degrades vitronectin
 JOURNAL Microb. Pathog. (1993) In press
 COMMENT Method: conceptual translation.
 FEATURES
 Location/Qualifiers
 source 1..398
 /organism="Streptococcus pyogenes"
 /isolate="MGAS 1882"
 /db_xref="taxon:1314"
 Protein 1..398
 /product="pyrogenic exotoxin B"
 /function="cysteine protease precursor"
 CDS 1..398
 /gene="speB gene"
 /coded_by="L26154.1:161..1357"
 /note="allele 37"
 /transl_table=11

ORIGIN

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1 mnkkklgirl lsllalggfv lanpvfadqn farnekeakd saitfiqksa aikagarsae
61 dikldkvnlg gelsgsnmyv ynistggfvi vsgdkrspei lgystsgsfd vngkeniasf
121 mesyveqike nkkldttyag taeifqpvvk slldskgi hy nqgnpynllt pviekvkpge
181 qsfvgqhaat ggvatataqi mkyhnypnkg lkdytytlss nnpynfhpkn lfaaistrqy
241 nwnnilptys gresnvqkma iselmadvgi svdm dygpss gsagssrvqr alkenfgynq
301 svhqinrsdf skqdweaqid kelsqnqpv yqgvkvvgga afvidgadgr nfyhvnwggw
361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

```

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Search for

☐ 1: AAA26984. pyrogenic exotoxi...[gi:431624] BLink, Domains, Links

LOCUS AAA26984 398 aa linear BCT 02-DEC-1993
 DEFINITION pyrogenic exotoxin B.
 ACCESSION AAA26984
 VERSION AAA26984.1 GI:431624
 DBSOURCE locus STRSPEBAE accession [L26155.1](#)
 KEYWORDS .
 SOURCE Streptococcus pyogenes
 ORGANISM Streptococcus pyogenes
 Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae;
 Streptococcus.
 REFERENCE 1 (residues 1 to 398)
 AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R.,
 Hamill,R.J., Patti,J.M. and Musser,J.M.
 TITLE A conserved Streptococcus pyogenes extracellular cysteine protease
 cleaves human fibronectin and degrades vitronectin
 JOURNAL Microb. Pathog. (1993) In press
 COMMENT Method: conceptual translation.
 FEATURES
 source 1..398
 /organism="Streptococcus pyogenes"
 /isolate="MGAS 1872"
 /db_xref="taxon:1314"
 Protein 1..398
 /product="pyrogenic exotoxin B"
 /function="cysteine protease precursor"
 CDS 1..398
 /gene="speB gene"
 /coded_by="L26155.1:161..1357"
 /note="allele 38"
 /transl_table=11

ORIGIN

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1 mnkkklgirl lsllalggfv lanpvfadqn farnekeakd saitfiqksa aikagarsae
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121 mesyveqike nkkldttyag taeikqpvvk slldskgi hy nqgnpynllt pvi ekvkpge
181 qsfvgqhaat g@vatataqi mkyhnpnkg lkdytytlss nnpyfhnphkn lfaaistrqy
241 nwnnilptys gresnvqkma iselmadvgi svdm dygpss gsagssrvqr alkenfgynq
301 svhqinrgdf skqdweaqid kelsqnqpv yqgv gkvgg h afvidgadgr nfyhva gwgw
361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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☐ 1: AAA26985. pyrogenic exotoxi...[gi:431626] BLink, Domains, Links

LOCUS AAA26985 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA26985

VERSION AAA26985.1 GI:431626

DBSOURCE locus STRSPEBAF accession L26156.1

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes
Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES

source 1..398
/organism="Streptococcus pyogenes"
/isolate="MGAS 1896"
/db_xref="taxon:1314"

Protein 1..398
/product="pyrogenic exotoxin B"
/function="cysteine protease precursor"

CDS 1..398
/gene="speB gene"
/coded_by="L26156.1:161..1357"
/note="allele 39"
/transl_table=11

ORIGIN

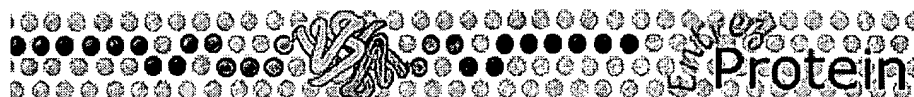
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1 mnkkklgirl lsllalsgfv lanpvfadqn farnekeakd saitfiqksa aikagarsae
61 dikldkvnlg gelsgsnmyv ynistggfvi vsgdkrspei lgystsgsfd angkeniasf
121 mesyveqike nkkldttyag taei1qpvvk slldskgihy nqgnpynllt pviekvkpge
181 qsfvgqhaat g2vatataqi mkyhnpnkg lkdytytlss nnpynhpkn lfaaistrqy
241 nwnnilptys gresnvqkma iselmadvgi svdmgygpss gsagssrvqr alkenfgynq
301 svhqinrsdf skqdweaqid kelsqnqpv yqgv3kvvgg afvidgadgr nfyhv4gwg
361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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☐ 1: AAA26986. pyrogenic exotoxi...[gi:431628]

BLink, Domains, Links

LOCUS AAA26986 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA26986

VERSION AAA26986.1 GI:431628

DBSOURCE locus STRSPEBAG accession [L26157.1](#)

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes

Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES Location/Qualifiers

source 1..398
 /organism="Streptococcus pyogenes"
 /isolate="MGAS 165"
 /db_xref="taxon:1314"
Protein 1..398
 /product="pyrogenic exotoxin B"
 /function="cysteine protease precursor"
CDS 1..398
 /gene="speB gene"
 /coded_by="L26157.1:161..1357"
 /note="allele 4"
 /transl_table=11

ORIGIN

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1 mnkkklgirl lsllalggfv lanpvfadqn farnekeakd saitfiqksa aikagarsae
61 dikldkvnlg gelsgsnmyv ynistggfvi vsgdkrspei lgystsgsfd vngkeniasf
121 mesyveqike nkkldttyag taeilqpvvk slldskgiy nqgnpynllt pviekvpge
181 qsfvgqhaat ggvatataqi mkyhnypnkg lkdytytlss nnpynfhpkn lfaaistrqy
241 nwnnilptys gresnvqkma iselmadvgi svdmgygpss gsagssrvqr alkenfgynq
301 svhqinrsdf skqdwesqid kelsqnqpv yqgvkvvgg afvidgadgr nfyhvngwg
361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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☐ 1: AAA26987. pyrogenic exotoxi...[gi:431630] [BLink, Domains, Links](#)

LOCUS AAA26987 398 aa linear BCT 02-DEC-1993
 DEFINITION pyrogenic exotoxin B.
 ACCESSION AAA26987
 VERSION AAA26987.1 GI:431630
 DBSOURCE locus STRSPEBAH accession [L26158.1](#)
 KEYWORDS .
 SOURCE Streptococcus pyogenes
 ORGANISM Streptococcus pyogenes
 Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.
 REFERENCE 1 (residues 1 to 398)
 AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.
 TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin
 JOURNAL Microb. Pathog. (1993) In press
 COMMENT Method: conceptual translation.
 FEATURES Location/Qualifiers
 source 1..398
 /organism="Streptococcus pyogenes"
 /isolate="MGAS 321"
 /isolate="MGAS 789"
 /db_xref="taxon:1314"
 Protein 1..398
 /product="pyrogenic exotoxin B"
 /function="cysteine protease precursor"
 CDS 1..398
 /gene="speB gene"
 /coded_by="L26158.1:161..1357"
 /note="allele 6"
 /transl_table=11

ORIGIN

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1 mnkkklg1rl lsllalggfv lanpvfadqn farnekeakd saitfiqksa aikagarsae
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121 mesyveqike nkkldttyag taeigqpvvk slldskgiyh nqgnpynllt pviekvkgpe
181 qsfvgqhaat gevatataqi mkyhnypnkg lkdytytlss nnpyfnhpkn lfaaistrqy
241 nwnnilptys gresnvqkma iselmadvgi svdmgygpss gsagssrvqr alkenfgynq
301 svhqinrsdf skqdweaqid kelsqnqpv yqgvkvvgga afvidgadgr nfyhvngwgwg
361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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Search for

☐ 1: AAA26988. pyrogenic exotoxi...[gi:431632] BLink, Domains, Links

LOCUS AAA26988 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA26988

VERSION AAA26988.1 GI:431632

DBSOURCE locus STRSPEBAI accession L26159.1

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes

Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES Location/Qualifiers

source 1..398
 /organism="Streptococcus pyogenes"
 /isolate="MGAS 262"
 /isolate="MGAS 303"
 /db_xref="taxon:1314"
 Protein 1..398
 /product="pyrogenic exotoxin B"
 /function="cysteine protease precursor"
 CDS 1..398
 /gene="speB gene"
 /coded_by="L26159.1:161..1357"
 /note="allele 6"
 /transl_table=11

ORIGIN

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1 mnkkklgirl lsllalggfv lanpvfadqn farnekeakd saitfiqksa aikagarsae
61 dikldkvnlg gelsgsnmyv ynistggfvi vsgdkrspei lgystsgsfd angkeniasf
121 mesyveqike nkkldttyag taei1qpvvk slldskgi1hy nqgnpynllt pviekv1kpge
181 qsfvgqhaat g1vatataqi mkyh1nypnkg lkdytytlss nnp1fyf1nhpkn lfaaistrqy
241 nwnnilptys gresnvqkma iselmadvgi svdmdygpss gsagssrvqr alkenfgynq
301 svhqinrsdf skqdweaqid kelsqnqpv1y yqgv1gkv1gga1 afvidgadgr nfyh1vn1g1wg
361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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Show:

☐ 1: AAA26989. pyrogenic exotoxi...[gi:431634] BLink, Domains, Links

LOCUS AAA26989 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA26989

VERSION AAA26989.1 GI:431634

DBSOURCE locus STRSPEBAJ accession L26160.1

KEYWORDS

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes

Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES Location/Qualifiers

source 1..398
 /organism="Streptococcus pyogenes"
 /isolate="MGAS 429"
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 /db_xref="taxon:1314"
 Protein 1..398
 /product="pyrogenic exotoxin B"
 /function="cysteine protease precursor"
 CDS 1..398
 /gene="speB gene"
 /coded_by="L26160.1:161..1357"
 /note="allele 7"
 /transl_table=11

ORIGIN

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1 mnkkklgirl lsllalggfv lanpvfadqn farnekeakd saitfiqksa aikagarsae
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121 mesyveqike nkkldttyag taeigpvvk slldskgihy nqgnpynllt pviekvkpge
181 qsfvgqhaat gevatataqi mkyhnpnkg lkdytytlss nnpynhpkn lfaaistrqy
241 nwnnilptys gresnvqkma iselmadvgi svdmgygpss gsagssrvqr alkenfgynq
301 svhqinrgdf skqdweaqid kelsqnqpy yqgvgkvggh afvidgadgr nfyhvggwg
361 gvsgdgffrld alnpsalgtg ggaggfngyq savvgikp

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☐ 1: AAA26990. pyrogenic exotoxi...[gi:431636] BLink, Domains, Links

LOCUS AAA26990 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA26990

VERSION AAA26990.1 GI:431636

DBSOURCE locus STRSPEBAK accession L26161.1

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes
Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES Location/Qualifiers

source 1..398
/organism="Streptococcus pyogenes"
/isolate="MGAS 660"
/db_xref="taxon:1314"

Protein 1..398
/product="pyrogenic exotoxin B"
/function="cysteine protease precursor"

CDS 1..398
/gene="speB gene"
/coded_by="L26161.1:161..1357"
/note="allele 8"
/transl_table=11

ORIGIN

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121 mesyveqike nkkldttyag taeiagpvvk slldskgi hy nqgnpynllt pviekvkgpe
181 qsfvgqhaat g@vatataqi mkyhnpnkg lkdytytlss nnpynhpkn lfaaistrqy
241 nwnnilptys gresnvqkma iselmadvgi svdm dygpss gsagssrvqr alkenfgynq
301 svhqinrsdf skqdweaqid kelsqnqpv yqvgkvgg afvidgadgr nfyhvgwgw
361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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Limits

☐ 1: AAA26991. pyrogenic exotoxi...[gi:431638] BLink, Domains, Links

LOCUS AAA26991 398 aa linear BCT 02-DEC-1993

DEFINITION pyrogenic exotoxin B.

ACCESSION AAA26991

VERSION AAA26991.1 GI:431638

DBSOURCE locus STRSPEBAL accession L26162.1

KEYWORDS .

SOURCE Streptococcus pyogenes

ORGANISM Streptococcus pyogenes
Bacteria; Firmicutes; Bacillus/Clostridium group; Streptococcaceae; Streptococcus.

REFERENCE 1 (residues 1 to 398)

AUTHORS Kapur,V., Topouzis,S., Majesky,M.W., Li,L.-L., Hamrick,M.R., Hamill,R.J., Patti,J.M. and Musser,J.M.

TITLE A conserved Streptococcus pyogenes extracellular cysteine protease cleaves human fibronectin and degrades vitronectin

JOURNAL Microb. Pathog. (1993) In press

COMMENT Method: conceptual translation.

FEATURES

source 1..398
/organism="Streptococcus pyogenes"
/isolate="MGAS 686"
/db_xref="taxon:1314"

Protein 1..398
/product="pyrogenic exotoxin B"
/function="cysteine protease precursor"

CDS 1..398
/gene="speB gene"
/coded_by="L26162.1:161..1357"
/note="allele 9"
/transl_table=11

ORIGIN

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1 mnkkklgirl lsllalggfv lanpvfadqn farnekeakd saitfiqksa aikagarsae
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121 mesyveqike nkkldttyag taeilqpvvk slldskgihy nqgnpynllt pviekvkgpe
181 qsfvgqhaat gevatataqi mkyhnpnkg lkdytytlss nnpyfnhpkn lfaaistrqy
241 nwnnilptys gresnvqkma iselmadvgi svdmgygpss gsagssrvqr alkenfgynq
301 svhqinrsdf skqdweaqid kelsqnqpv yqvgkvgga afvidgadgr nfyhvnggw
361 gvsdgffrld alnpsalgtg ggaggfngyq savvgikp

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